OUTFALL MONITORING SCIENCE ADVISORY PANEL (OMSAP) MEETING
Monday, July 15, 2002, 10:00 AM to 2:00 PM, WHOI Redfield Auditorium
FINAL MINUTES

ATTENDANCE

Members Present: Andy Solow, WHOI (chair); Bob Beardsley, WHOI; Norb Jaworski, retired; Scott Nixon, URI; Judy Pederson, MIT/Sea Grant; Mike Shiaris, U Mass Boston; and Jim Shine, Harvard School of Public Health.

Observers: Bruce Berman, Save the Harbor/Save the Bay; Mike Bothner, USGS; Todd Callaghan, MCZM; Cathy Coniaris, MADEP; Mike Delaney, MWRA; David Dow, NMFS; Marty Dowgert, USFDA; Dave Duest, MWRA; Stephen Estes-Smargiassi, MWRA; Patricia Foley, Save the Harbor/Save the Bay; Sal Genovese, Safer Waters in Massachusetts; Janine Geraigery, MWRA; David Gilmartin, MWRA; Pam Harvey, MADEP; Carlton Hunt, Battelle; Russell Isaac, MADEP; Mingshun Jiang, U Mass Boston; Chris John, MWRA; Ken Keay, MWRA; Ben Kelly, Save the Harbor/Save the Bay; Wendy Leo, MWRA; Suh Yuen Liang, MWRA; Matt Liebman, EPA; John Lipman, Cape Cod Commission; Alison McCabe, MWRA; Mike Mickelson, MWRA; Andrea Rex, MWRA; Jack Schwartz, MADMF; Silvia Spring, Save the Harbor/Save the Bay; Crista Trapp, Harvard School of Public Health; Steve Tucker, Cape Cod Commission; and Meng Zhou, U Mass Boston.
Boston University students: Fahed Alzonoohi, Brenda Berasi, Irfan Budisiswanto, Kullaya Chiammanisakul, Marcore Claudio, Vicki Ann Frawley, Zack Gou, Tom Goucher, Tamim Jabr, Jessica Kelly, Laurie Lopez, Juan Pablo Mendoza, Mary Murphy-Phillips, Megan Newcomerc, Gerry Poulin, Jessica Rosery, Herb Ross, Sunit Srisainsuchat, Jin Toppi, and Yu-Chi Wang.

SUMMARY OF ACTION ITEMS & RECOMMENDATIONS

1. OMSAP approved the April 29, 2002 minutes with no amendments.
2. OMSAP decided on a time line and process of review:
    - OMSAP will host two workshops to review the monitoring plan by task (e.g. effluent, fish/shellfish, benthos, water quality), PIAC and IAAC members work with OMSAP to provide input.
    - Outside experts will be invited to attend the workshops.
    - If additional questions arise out of the workshops, then OMSAP will form subcommittee(s). Subcommittees will consist of OMSAP, PIAC, and IAAC members, and outside expertise.
    - After each workshop, there will be a follow-up meeting for OMSAP to develop recommendations.
    - Additional issues to be addressed during the review:
        - Include suggestions for alternative measurement technologies, especially for those questions where natural variability indicates need for very high number of samples.
        - Review reporting frequency – is the present volume and frequency of reports appropriate or needed, or should some of the reporting emphasis shift to publishing in peer-reviewed literature.
        - Quality Assurance for each task area.
        - Internet availability of data.
        - How the Bays Eutrophication Model can be used in the review process.

- Identify long term datasets that MWRA can use to lengthen their baseline record.
- Which questions are "ongoing" for foreseeable future?
- Data from other monitoring programs that are relevant or likely to continue should be included (e.g. Center for Coastal Studies, Gulf of Maine Ocean Observing System, GulfWatch, United States Geological Survey).
- Are emerging tracers useful (e.g. nitrogen isotopes, caffeine, endocrine disruptors, antibiotics).

Rec'd Schedule	Task
July through September 2002	• MWRA review other projects that evaluated monitoring plans for ideas on the process (National Research Council, S. California, Chesapeake, S. Florida, Tampa Bay, San Francisco Bay, Mamala Bay Hawaii). • MWRA review monitoring questions, suggests questions which have been answered, which should be revised in light of new information, which questions remain the same. • OMSAP develop a list of questions they would like MWRA to address.
September 2002	**OMSAP MEETING** **September 24, 10:00-2:00, DEP Boston** • MWRA will present their evaluation of other monitoring plans. • MWRA will present questions that the monitoring plan is supposed to address and potential new questions. • MWRA will present, if needed, information about water quality statistics. • MWRA identifies if there are any potential "fast track changes" of parameters or sampling locations - if OMSAP and regulators agree, MWRA submits those proposed modifications to EPA and DEP as interim modifications. • OMSAP will: discuss, possibly modify monitoring questions; plan workshops by task area (effluent, water column, sediment, fish and shellfish); determine schedule for each task area or each question; identify emerging questions for monitoring and/or special supporting studies.
September through November 2002	• Invite outside experts to workshops. Include engineers knowledgeable about treatment processes and effluent monitoring where appropriate. • MWRA will consider refinements to monitoring questions that may be necessary in order to conduct power analysis of sampling design. For example, the questions may need to be phrased in terms of numeric hypotheses. • Some questions may appropriately be split into "spatial extent of change" and "temporal trends near the outfall." These two types of question might require differing sampling designs. • How do we determine the appropriate duration of the individual monitoring studies? • Can the Bays Eutrophication Model be used to evaluate some pieces of the monitoring plan? • OMSAP review/approve final set of monitoring questions.
November 2002	**OMSAP 2 DAY TECHNICAL WORKSHOP:** **EFFLUENT, PATHOGENS, FISH/SHELLFISH BIOACCUMULATION, SEDIMENT CONTAMINANTS**

Nov 2002 - Jan 2003	• OMSAP meet to make final recommendations after November workshop.
February 2003	**OMSAP 2-3 DAY TECHNICAL WORKSHOP: WATER QUALITY, BENTHIC COMMUNITY**
February-June 2003	• MWRA and consultants conduct power analyses to determine frequency and location of sampling for each area where data already exist. Can the data answer the questions? • OMSAP meet to make final recommendations after February workshop. Discuss how results of power analyses affect monitoring designs. • Include special effluent sampling in this analysis.
July 2003	• MWRA produces initial draft of revised monitoring plan. • OMSAP meet to review initial draft of revised monitoring plan.
August 2003	• MWRA produces draft of revised monitoring plan.
September 2003	• OMSAP meets to develop preliminary recommendations, seeks additional public and regulator input.
November 2003	• MWRA submits final revised monitoring plan. • OMSAP makes recommendation to regulators on monitoring plan. • OMSAP recommends a process for any further revisions that may be needed over time (e.g. recommends to EPA and DEP that revisions can continue even after permit expires, and specific recommendations on further results that would be needed before a particular revision could be recommended).
January 2004	• After receiving public comment, EPA and DEP approve monitoring plan.

MINUTES

WELCOME, APPROVAL OF MINUTES
ACTION: OMSAP approved the April 29, 2002 minutes with no amendments.

PUBLIC INTEREST ADVISORY COMMITTEE UPDATE
P. Foley summarized the April PIAC meeting. PIAC members present at that meeting thought that cost should not drive discussions on monitoring such as the discussion on mussel contaminant monitoring at the April OMSAP meeting. Overall, the members present felt that monitoring is extremely important and we should not be limited to the current monitoring approaches. PIAC will meet later today to discuss the plan for reviewing the monitoring plan and will communicate what they think their role should be with OMSAP and the regulators.

OVERVIEW OF MWRA'S EFFLUENT OUTFALL AMBIENT MONITORING PLAN AND SUMMARY OF SHORT-TERM RESULTS
M. Mickelson reviewed MWRA's current monitoring plan [for details see: MWRA's information briefing entitled "Overview of MWRA's Effluent Outfall Ambient Monitoring Plan and summary of short-term results"; "MWRA effluent outfall monitoring plan: Phase II post discharge monitoring"

http://www.mwra.state.ma.us/harbor/enquad/pdf/ms-044.pdf; and "2000 Outfall monitoring overview" http://www.mwra.state.ma.us/harbor/enquad/pdf/2001-10.pdf].

M. Mickelson outlined the basic monitoring questions considered when the monitoring plan was developed:
- Are fish and shellfish safe to eat (with respect to toxics)?
- Are shellfish safe to eat (with respect to pathogens)?
  Also, Is it safe to swim?
- Are living resources protected from enrichment?
- Are living resources protected from toxics?
- Are aesthetics being maintained?

DEVELOPMENT OF A PROCESS FOR EVALUATING THE MONITORING PLAN

A. Rex outlined their example of a time line for monitoring plan review [for details see MWRA's information briefing: "Process considerations for reviewing and modifying MWRA's Effluent Outfall Ambient Monitoring Plan"]. A. Solow then opened the discussion up to OMSAP and the audience.

S. Nixon wondered how MWRA measures ecosystem degradation. K. Keay thinks this measurement is indirect, at best. For example, MWRA monitors the benthic community in the nearfield and farfield compared to the nine year baseline and looks for changes that are indicative of degradation. S. Nixon thinks "ecosystem degradation" has no operational definition. M. Mickelson noted that the questions listed above were developed in 1991 based on concerns. The Outfall Monitoring Task Force (OMTF) worked with us to develop specific studies that could test related aspects. A. Rex added that the concept of ecosystem degradation was translated into detailed monitoring questions.

J. Pederson pointed out that most of the questions listed above were based on public concerns about the outfall. K. Keay added that these questions were broken down into ~23 specific questions listed in the "MWRA effluent outfall monitoring plan phase I: baseline studies". The original monitoring plan development was an effort to translate the broad concerns into more testable studies. M. Mickelson added that these questions have been made quantitative in the Contingency Plan which contains 97 thresholds.

S. Nixon noted that there is no operational definition for degradation and so he does not think it is a useful term. It is not a term that should be used in a monitoring program, it is fine for a public discussion, then your job is to translate that into something you can measure and make sense out of. J. Shine asked if S. Nixon thought that benthic infaunal diversity was an indicator of ecosystem degradation. S. Nixon replied no, ecosystem degradation cannot be measured.

D. Dow asked relative to the recent press on right whales and the Center for Coastal Studies (CCS) work, how MWRA monitors marine mammals. M. Mickelson noted that D. Dow is referring to an article in the Cape Cod Times which arose from observations by the Center for Coastal Studies that right whale numbers and zooplankton measurements were very low in Cape Cod Bay this spring and the article reported thatthe CCS nitrogen isotope study has shown nitrogen from the outfall stretching down to Plymouth. The article implied that those two observations are connected. He thinks that this is a stretch and the authors of the research would also agree. M. Mickelson responded to D. Dow's question by saying that MWRA has a dedicated marine mammal observer on board during its surveys. During the baseline period, not many whales were found near the vicinity of the outfall and so far there is no evidence that whales are attracted to the outfall. MWRA is also providing water samples to the

CCS for their nitrogen isotope tracer study. The CCS nitrogen isotope tracking data have shown that the outfall plume is measurable down to the waters off of Plymouth, comparing well to the ammonia effluent signal measured by MWRA.

A. Solow returned to the discussion about ecosystem degradation. He agreed with what was said about that and added that it seems that some of the monitoring is aimed at very well specified questions, like is the level of toxics exceeding some threshold. Ecosystem monitoring is exploratory, so it is a good idea to continue monitoring to see if anything unanticipated occurs. M. Mickelson pointed out that thresholds relate to human health, degradation, or change. A. Rex noted that in addition to the regular outfall monitoring, MWRA also conducts exploratory special studies that examine specific questions about the environment, e.g. zooplankton ecology. K. Keay agreed that it is good to continue monitoring to see that there are no detrimental effects of the outfall, or subtle changes that might not otherwise be detected. B. Berman thinks it is important to continue monitoring for quite some time to pick up subtle changes (i.e. the difference between variability and trends).

M. Bothner thinks it is important to try to discern trends from variability. He asked if MWRA measures a spike in floatables collected in Mass Bay during the summer from boaters. M. Mickelson replied that they do see more trash in the summer that is too large to have passed through the treatment plant. The outfall plume surfaces in the winter and sometimes a fine white material can be seen. This material has been analyzed and is composed of fats and harmless bacteria. There is also a species of diatom called *Thalassionema* that can sometimes be measured around the outfall.

S. Nixon thinks the issue of right whales and zooplankton is an example of why the monitoring is in place. He asked if MWRA responded to the recent press on right whales and the outfall. A. Rex replied that they did not respond because it was an issue of misreporting. In addition, the science of why the right whales numbers were so low in Cape Cod Bay is difficult to explain. We also did not have any data available from the Center for Coastal Studies that we could respond to. J. Pederson agreed that there were no data available so OMSAP did not respond. It did not make sense to respond and have this escalate without having any data.

J. Pederson returned to the question of how we define ecosystem degradation because she thinks that the OMTF was trying to address this with the last two questions listed above. She does not think that we deal with this well scientifically. That is why it would be good to look at how we might do things better. She asked N. Jaworski and S. Nixon, based on their experience, how other monitoring programs have dealt with this issue. N. Jaworski described the only long term data set he could find, from the Potomac River and Chesapeake Bay for dissolved oxygen (DO) and nutrients. Even though there has been a significant decrease in phosphorus discharged to the Upper Potomac, phosphorus levels in the surface waters and DO in the bottom waters in the lower estuary have not changed since 1965.

J. Shine agreed that we can successfully measure parameters such as DO, salinity, and nutrients, but how ecosystem health is measured has been a longstanding question. S. Nixon thinks it is difficult because the public does not understand or necessarily care about the benthic community structure. He thinks that a benthic degradation index would be a mistake. The other programs that he knows of use the same approach, monitor as much as possible, then look differences between variability and trends. K. Keay noted that MWRA uses indicators of change for the benthic community, not a benthic degradation index. S. Nixon thinks that there is a danger when “report cards” are prepared for bodies of water. J. Shine agreed with S. Nixon. To measure a degraded system, there are measurements like

evenness and richness in the benthic community structure that are somewhat indicative of change. S. Nixon said that everyone thinks of diversity as good, but it may not matter in terms of function. N. Jaworski thinks that the most difficult thing to say is if enrichment has been enhanced, because it cannot even be seen in the 40 years worth of Potomac/Chesapeake data.

B. Beardsley asked about the scientific response to future press releases. A. Rex said that OMSAP advises EPA and MADEP, but if MWRA had data available, they would share it with OMSAP for review. Perhaps the process of responding to press should be made more formal. B. Berman said that Save the Harbor/Save the Bay received telephone calls regarding the recent press, but we did not respond because we also did not have any data. P. Foley does not think we can establish formal rules on how to respond to press. She thinks in the future, the OMSAP and PIAC chairs should confer before there is a response to press.

OMSAP then began a discussion to develop a plan for reviewing the monitoring plan. A. Rex noted that even though the outfall has been on-line for almost 2 years, there are plenty of data available that can be analyzed to see if we are monitoring well. We anticipate that the review will take about a year and a half. We want OMSAP to lead it, and it is extremely important that the regulators and the PIAC also be involved. We think that it might be possible to fast track some changes, and that will also have to be reviewed. We suggest OMSAP form subcommittees to review parts of the monitoring and include members of the public and regulatory agencies. We suggest that the monitoring questions be reviewed and modified and MWRA will be analyzing the 10 years of data to help that along. We suggest that changes to the sampling design be based on statistical analyses and also technical advances including new ways to measure, for example measuring DO *in situ* or the use of satellite imagery. Finally the process does require, as outlined in the permit, public notice and regulatory approval. We hope to have changes in place by calendar year 2004. MWRA's goal is to make this make this program better focused and more efficient. She asked the regulators, EPA and MADEP, if MWRA is taking the correct approach in asking OMSAP to review the monitoring plan within the process that is outlined in the permit. P. Harvey replied yes, this approach will work. There is a provision in MWRA's discharge permit about changes in the monitoring plan which is different from a formal permit modification and also different from the permit renewal process so that the notice is through the Environmental Monitor for public comments and the EPA and MADEP approve the changes. The permit allows for a less complicated and extensive process for monitoring plan revisions than actual permit changes.

N. Jaworski asked if MWRA's statement "incorporate findings from monitoring to date" includes other data, e.g. fisheries. A. Rex replied that they would look at this, if OMSAP asked them to. J. Pederson said that when the monitoring plan was being developed, because the MA Division of Marine Fisheries (MADMF) was studying fish populations, the OMTF decided that MWRA did not have to monitor fisheries. However, this can be revisited.

A. Solow thinks, in principle, the process outlined by MWRA seems straightforward. P. Foley believes that there should be more public notice in this process. She thinks that perhaps PIAC may want to host public meetings. B. Berman added that it might be useful, in additional to having public participation in the subcommittees, to have regional public meetings sooner in the beginning, rather than at the end.

R. Isaac believes it is important to go through this review process and examine the data. However it may be difficult to drop any monitoring with such a short post-discharge period. A. Solow thinks that

is why statistical analyses will be important, to examine statistical power. R. Isaac added that it might also be possible to see a trend that is not due to the outfall. Some statistically significant changes may not be due to the outfall. A. Solow agreed and said that this is why it is important to look for pre-discharge trends. S. Nixon thinks that the 10 years of data is enough to be able to tell us if the monitoring sample design is sufficient. A. Solow agreed. J. Pederson thought perhaps now we could try to use modeling and the monitoring together more effectively. Bob Beardsley agreed. He also supported what N. Jaworski had to say, in that this is a good opportunity to compare the monitoring data with the other environmental data that have been collected, for example, the Boston Buoy has collected data for decades. Also, there might be long term fishery data that would be useful to have to help with the trends analysis. A. Solow thought that was a good idea.

W. Leo asked that OMSAP suggest if there are other examples of long term outfall monitoring programs, besides the list provided by MWRA, that have well-documented reviews of their monitoring. S. Nixon thinks that Florida Bay is a good example. He suggested MWRA contact the South Florida Water Management District. He also suggested MWRA contact the Tampa Bay National Estuary Program. B. Beardsley suggested that they look into San Francisco Bay monitoring. J. Pederson suggested Mamala Bay in Hawaii.

A. Solow asked what was meant in MWRA's information briefings about "emerging questions". A. Rex replied that there are some questions that MWRA does not examine that may prove to be important, e.g. estrogen mimickers. N. Jaworski asked whether the review process should be undertaken by question or task (e.g. effluent, water quality, benthos, fish/shellfish). He thinks by task is more logical, but noted that one task can answer more than one question. OMSAP agreed that the review should proceed by task.

N. Jaworski suggested that Quality Assurance (QA) is addressed during this review process. We will not know how well the monitoring plan is working unless we spend some time looking at QA. B. Beardsley thinks that we should also look at how the monitoring data are presented on the web so that others have the ability to review the data. B. Berman thinks that is a good idea and also thinks that it would be good to host a public meeting in the September-November 2002 time frame to present the review process.

S. Nixon asked what the role of Battelle will be during this review process. A. Rex replied that they will have an important role in conducting power analyses and helping the MWRA staff compile and analyze the monitoring data. OMSAP then discussed Battelle participation the review vs. conflict of interest. B. Beardsley thinks that Battelle understands issues such as spatial variability very well since they collect the samples and analyze the data. They should definitely be present during the review process, but not making decisions.

OMSAP then discussed whether they should convene subcommittees to review parts of the monitoring plan. J. Pederson said that there were no subcommittees when the monitoring plan was developed. Instead, there were dedicated workshops to look at parts of the monitoring plan, e.g. nutrients, benthic communities, and invite outside experts. The OMTF did not make decisions at these workshops, instead, they had time to absorb the information and make decisions at a later meeting. All those interested were invited, including outside experts not involved with the MWRA monitoring. S. Nixon agreed to proceed with the review on a task-by-task basis, and he also agreed to invite outside experts. The value of OMSAP is its diverse experience and having subcommittees meeting on their own would lose the value of interaction among OMSAP members. A. Solow liked the idea of having a 2-day

workshop to review a portion of the monitoring plan and inviting additional outside experts to attend. If there are questions that arise out of the workshops, then form a subcommittee.

OMSAP discussed the time frame for review. K. Keay said that all 2002 data will not be ready until February 2003. J. Pederson and A. Solow both thought it was important to begin the review process, even if all of the 2002 data were not available. J. Pederson noted that the November 14, 2002 meeting date should be rescheduled because there is an invasive species workshop then. She suggested trying to schedule the workshop on Monday and Tuesday of that same week.

C. Hunt asked OMSAP what they would like to see presented to them at the September 24, 2002 OMSAP meeting. B. Beardsley thought that it would be useful for MWRA to send OMSAP what they plan to present and then OMSAP can comment in greater detail. J. Pederson said that the water quality aspect of the monitoring is the most complicated would need its own 2-day workshop. S. Nixon thinks that for water quality, we should be looking at how "smart" the sampling density is in the nearfield and the farfield and number of stations required, etc. A. Rex noted that the answer to this question may be different for each parameter. K. Keay added that this is why we need the questions OMSAP wants addressed by September.

J. Pederson thinks that the November date is not set in stone, it depends if MWRA's data analyses are completed in time. She thinks that the first 2-day workshop should address toxic contaminants and biota because the questions for these tasks are less complicated than those for water quality. S. Nixon added that effluent data evaluation is also relatively straightforward so this could also be addressed at the first 2-day workshop. It is also less complicated because OMSAP only has to review the effluent monitoring that is not mandated by the discharge permit. A. Solow said that the February 2003 2-day workshop could address water quality and benthic community monitoring.

A. Rex asked OMSAP if they thought new questions would arise before or during the workshop. A. Solow hopes that new questions could be identified before the workshops. B. Beardsley suggested that MWRA provide to OMSAP a list of old questions and potential new questions. OMSAP could comment and add to the list. A. Solow said that this could be presented at the September 24 meeting. At the workshop, we will review whether the monitoring is answering these questions. OMSAP agreed. N. Jaworski thought that the chlorophyll QA problem in fall 2000 is one example that could be presented on how MWRA addressed the problem.

S. Nixon asked how MADMF analyzes their fish data and whether they produce reports. R. Isaac replied that because of budget cutbacks, they no longer do chemical analyses, but they do still conduct fishery assessments. A. Rex said that OMSAP should also review MWRA's reporting frequency, e.g. schedule for producing reports. A. Solow agreed. D. Dow noted that NMFS northeast shelf fisheries data will soon be posted on-line according to region. Mass Bay would be listed as part of the Gulf of Maine. This dataset includes temperature and salinity data since the 1960's.

A. Solow summarized that MWRA will present the monitoring questions and their review of other monitoring plans at the September meeting. There will then be two workshops, one in November 2002 (two days) and the other in February 2003 (two to three days). C. Hunt asked if they can they present some information on water quality statistics to OMSAP before the February 2003 workshop. A. Solow thought that it would be ok to do this at the September 2002 meeting. B. Beardsley would like two things to be considered during the review: how the Bays Eutrophication Model can be used in this process and identifying long term datasets that MWRA can use to lengthen their baseline record. C.

Hunt asked if these datasets should be within Mass Bay. B. Beardsley replied that is depended on the data. For example, there is a buoy offshore of Portland, Maine that has been collecting data for ~30 years, longer than the Boston Buoy.

S. Nixon added that after OMSAP recommends revisions and MWRA makes changes to the monitoring plan, the OMSAP should review the new monitoring plan. J. Pederson suggested that folks review the National Research Council book "Managing Troubled Waters". She said after a 2-day workshop, there needs to be a follow-up meeting when OMSAP makes decisions. Since there is so much information presented at workshops, it is important that OMSAP has some time to absorb the presentations and develop recommendations.

A. Solow asked what was meant on the MWRA information briefing about "fast track changes". A. Rex said that there are some changes that are simple and may be without controversy that can be reviewed in a relatively short amount of time. A. Solow asked if MWRA can present these at the September 2002 OMSAP meeting. A. Rex agreed. P. Harvey thought that was fine since there is a process outlined in the permit for annual changes to the monitoring plan.

A. Solow asked PIAC how they felt about this process for review. P. Foley said that she is grateful that OMSAP seems serious about this review and thinks the categories of discussion are on target. PIAC will discuss how the public should be involved during this review and will report back to OMSAP.

M. Liebman asked what factors will be evaluated to determine whether or not the monitoring plan is revised. A. Rex thinks that will be a topic of the September 2002 meeting. A. Solow added that the monitoring plan is designed to answer questions and OMSAP will determine if this is occurring. M. Liebman said that there are other implicit factors that should be made explicit early on. N. Jaworski thinks that this cannot be done until the data are examined and we have an idea of the natural variability. J. Pederson thinks that it would be interesting if someone could come up with better ways to monitor, for example, monitoring with a line of buoys as opposed to collecting samples using ships. A. Solow agreed.

ACTION: OMSAP decided on a time line and process of review. See page 1 for details.

ADJOURNED

MEETING HANDOUTS:

- Agenda
- July 2002 OMSAP/PIAC/IAAC membership lists
- April 2002 draft OMSAP minutes
- MWRA information briefings and copy of presentation

Summary prepared by C. Coniaris. Post-meeting comments are included in [brackets]. All such comments have been inserted for clarification only. They do not, nor are they intended to, suggest that such insertions were part of the live meeting components and have been expressly set-off so as to avoid such inference.